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Montana Agricultural Experiment Station

Bozeman, Montana

MONTANA WATER SUPPLY OUTLOOK

Snowpack and Streamflow Forecasts as of October 1, 1983

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SNOW SURVEY UNIT
Federal Bldg., Rm. 443
10 East Babcock
Bozeman, MT 59715

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The Montana Water Supply Outlook is a publication of the U.S. Soil Conservation Service. The SCS administers the Cooperative Snow Survey Program in cooperation with other federal, state and private agencies, organizations, and individuals.

The report is prepared by SCS, Snow Survey and Water Supply Forecast Staff, Federal Building, Room 443, 10 East Babcock, Bozeman, Montana.

FEDERAL STATE PRIVATE
COOPERATIVE SNOW SURVEYS

Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro electric power generation, navigation, mining and industry

"The Conservation of Water begins with the Snow Survey"

Ideal weather helps stretch low snowpack

The 1982-83 winter brought less than average snowfall to the mountain areas but ideal runoff conditions helped alleviate major shortages of irrigation water.

The 1983 snow season began in September 1982 witb quite variable snowfall although heavy snows fell in some areas. October was drier but snowfall improved in November and December.

By January 1, most mountain areas in Montana had accumulated near average water equivalent in the snowpack.

A small area in the extreme southwest corner of the state did have above average snow. On the edge of many storms south of Montana, this area received considerable moisture. Even though major storms occurred south of Montana, January snowfall was below average for most of the state. Also, January temperatures were very mild.

February temperatures continued well above average with some new record highs being set. Storms continued to develop south of Montana adding moisture to the extreme southwest, but with very low snowfall occurring through the central mountain ranges.

March brought heavy moisture on the east slope of the Beartooth Range near Red Lodge, and in the southwest and northwest corners of Montana. However, the central portion of Montana reported less than 70 percent snowpack. Warm temperatures in the month allowed some melt and by April 1, the majority of the state had less than average levels of water stored in the accumulated snowpack.

April storms continued to miss most of Montana and snowmelt started again after mid-April. Moisture accumulations followed patterns established earlier in the winter.

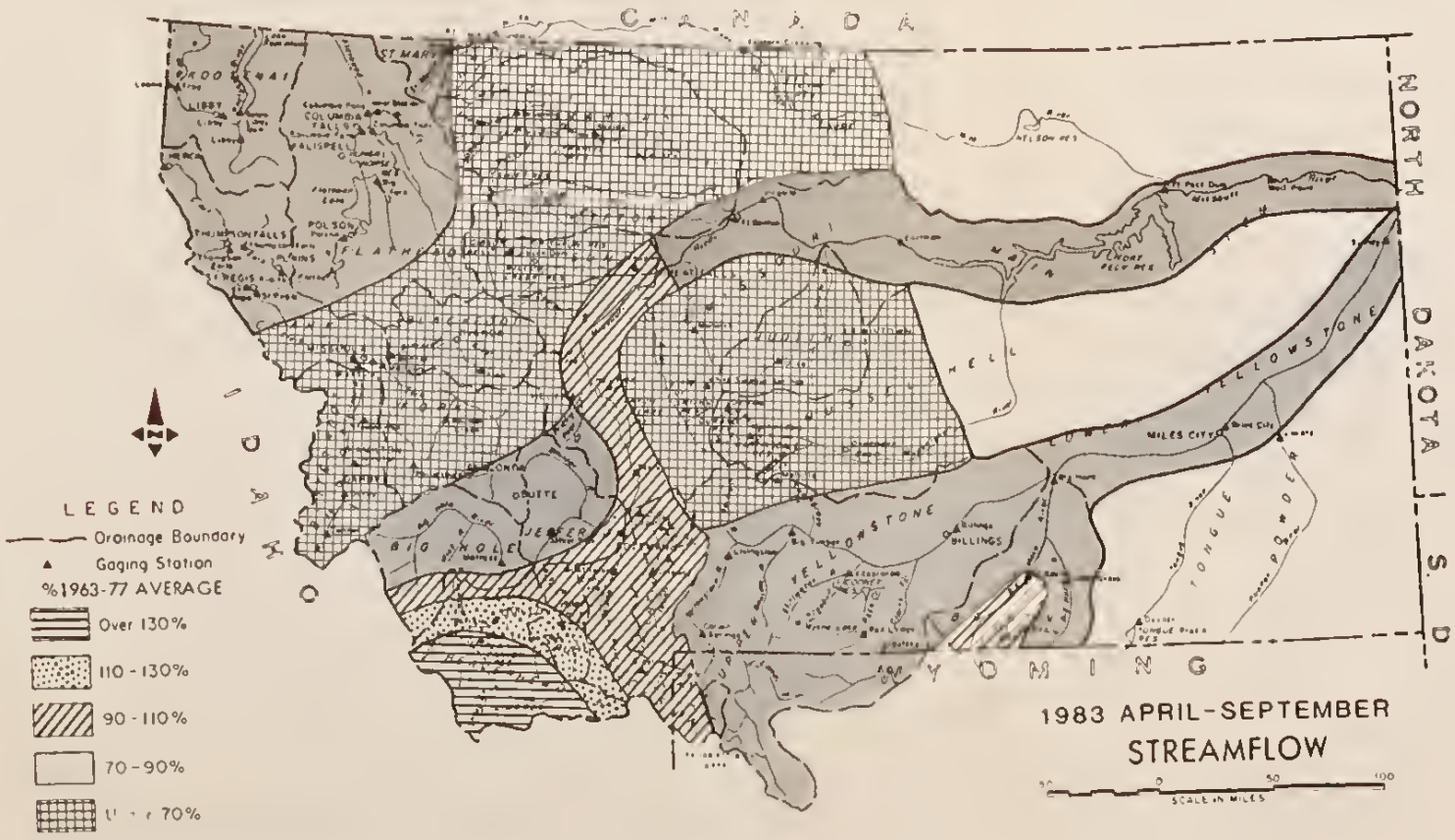
Early May temperatures cooled and slowed mountain snowmelt. Early May storms brought good snowfall to some areas of central Montana helping the very low moisture conditions, but mid-May measurements showed the water content of the mountain snowpack was nearly the same as the May 1 levels.

By June 1 about one-half of the season's snow accumulation had melted. This early runoff was very orderly with very little flooding. The weather cooled in June and moisture increased. The cooler temperatures helped maintain the orderly runoff for the rest of the main runoff period and slowed snowmelt which helped ease potential water shortages.

Favorable weather, moisture and runoff patterns greatly assisted water users in making efficient use of the below average water supply in most of Montana and enabled reservoir operators to hold stored water later in the season.

Recent fall storms have helped restore some soil moisture in most areas. Moisture near the end of September and early October had been heaviest in the southern part of the state.

Presently, most reservoirs have near average carry-over storage.



Based on provisional data provided by:

U.S. Geological Survey
Bureau of Reclamation
National Weather Service
Soil Conservation Service
Montana Power Company
and others

RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH September 30, 1983

Basin or Stream	RESERVOIR	Usable Capacity	Usable Storage: This Year	Usable Storage: Last Year	Usable Storage: Average
	COLUMBIA				
Kootenai	Koocanusa	5,748.2	5,481.0	5,693.0	---
Flathead	Hungry Horse	3,451.0	3,121.0	3,440.0	2,910.0
	Flathead Lake	1,791.0	1,712.0	1,655.0	1,719.0
	Camas (4)	45.2	28.0	28.3	17.5
	Mission Valley (8)	100.3	49.2	29.3	30.7
Clark Fork	Georgetown Lake	31.0	30.9	28.4	29.0
	Lower Willow Creek	4.9	2.6	1.7	1.0
	Nevada Creek	12.6	---	---	4.0
	Noxon Rapids	334.6	308.6	323.8	325.5
Bitterroot	Painted Rocks	31.7	---	---	22.7
	Como	34.9	---	---	2.5
	MISSOURI				
Beaverhead	Lima	84.0	55.2	37.5	32.6
	Clark Canyon	257.2	158.9	163.6	130.4
Ruby	Ruby	38.8	---	---	12.8
Madison	Hebgen Lake	377.5	356.2	324.8	338.1
	Ennis Lake	41.0	37.4	36.2	37.3
Gallatin	Middle Creek	8.0	3.2	4.4	3.6
Missouri	Canyon Ferry	2,043.0	1,867.0	1,802.0	1,760.0
	Hauser & Helena	61.9	63.0	51.8	58.3
	Lake Helena	10.4	10.9	10.7	10.6
	Holter Lake	81.9	81.0	81.0	78.4
	Fort Peck Lake	18,910.0	16,510.0	16,220.0	16,950.0
Smith	Smith River	10.6	7.0	---	5.4
	Newlan Creek	12.4	9.3	9.2	---
Musselshell	Bair	7.0	1.7	---	3.2
	Martinsdale	23.1	8.6	---	10.7
	Deadman's Basin	72.2	38.9	---	38.4
Sun	Gibson	99.1	31.6	37.1	29.7
	Willow Creek	32.2	23.6	22.4	20.4
	Pishkun	32.0	12.1	22.4	20.4
Marias	Lower Two Medicine	11.9	---	---	4.0
	Four Horns	19.2	---	---	11.1
	Swift	30.0	4.1	7.6	12.3
	Lake Frances	111.9	50.8	86.4	71.4
Milk	Elwell (Tiber)	1,347.0	746.8	668.0	564.3
	Beaver Creek	3.5	3.1	3.0	2.0
	Fresno	127.2	34.2	16.7	62.8
	Nelson	66.8	23.2	46.9	40.4
	HUDSON BAY				
St. Mary's	Lake Sherburne	64.3	10.0	21.6	9.1
	YELLOWSTONE				
Stillwater	Mystic Lake	21.0	21.0	19.2	18.9
Clark's Fork	Cooney	27.4	15.2	14.5	12.7
Tongue	Tongue River	68.0	10.5	---	24.8
Bighorn	Bighorn Lake	1,356.0	1,062.0	1,061.0	707.9

Average based on 1968-82 period.

SCS adds two SNOTEL sites

The Soil Conservation Service installed two additional SNOTEL sites this summer bringing the total number of operational sites in Montana to 67.

The site named DUPUYER CREEK, elevation 5,750 feet, is northwest of Choteau. The Pondera County Canal and Reservoir Company assisted with this installation. Data will be used for operation of Swift Reservoir and Lake Frances and for irrigation water management.

The second new site is at the MSU Experiment Station west of Bozeman. At an elevation of 4,775 feet, this site already has some sensors installed and soil moisture sensors will be installed this fall. This site is named BOZN EXP FARM.

CHANGE OF ADDRESS

Please note that the mailing address of the Snow Survey Unit has changed. All correspondence should be directed to:

USDA, SCS, Snow Surveys
Federal Bldg., Rm. 443
10 East Babcock
Bozeman, MT 59715

Snow survey comparison base changes

Beginning January 1, 1984, the base period for all comparisons of current snow water equivalent, streamflows and other hydrologic and climatic indicators will be expanded from 15 to 20 years.

The new base period is from 1961 through 1980. Previously a 15-year base (1963-1977) was used.

The new base is not expected to significantly change comparisons made with the 15-year base.

Tabulations of new averages for snow course water equivalents will be available for distribution to user agencies, groups and individuals needing this data.

Montana snow survey responsibilities expand

The Soil Conservation Service snow survey staff in Bozeman is now maintaining snow courses and SNOTEL sites in the Missouri River drainage in Wyoming besides those sites in Montana as a part of an agency reorganization. The Bozeman office will issue forecasts and reports for Montana as in past years.

The reorganization increased forecasting capabilities in the Portland, Oregon, office. This office will initiate short-term forecasting on some Montana streams in the near future.

Additional water supply forecast products, capabilities and services will become available with the reorganization. You will be informed of these additions as they come on line.

1983 SNOW COVER COMPARISONS (as a percent of average)

	JAN.1	FEB.1	MAR.1	APR.1	MAY 1
COLUMBIA RIVER DRAINAGE					
Kootenai	83	97	89	86	86
Flathead	100	93	85	85	84
Upper Clark Fork	93	76	76	75	71
Lower Clark Fork	96	89	86	83	77
Bitterroot	87	87	81	80	74
MISSOURI RIVER DRAINAGE					
Jefferson	127	100	95	105	99
Madison	127	96	99	103	100
Gallatin	97	74	82	88	85
Missouri Main Stem	83	72	70	74	72
Judith-Musselshell	71	61	68	72	62
Marias-Teton-Sun	81	76	65	67	61
Milk	93	82	61	53	55
YELLOWSTONE RIVER DRAINAGE					
Yellowstone (above Bighorn)	84	78	77	79	79
Bighorn	--	84	79	80	93
Little Big Horn	--	88	81	71	63
Tongue	--	96	83	80	75
Powder	--	100	79	86	68
SASKATCHEWAN RIVER DRAINAGE					
St. Mary's	98	94	87	85	72

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